UNIVERSITY OF THE PHILIPPINES DILIMAN
SCHOOL OF STATISTICS
TM KALAW STREET, UP DILIMAN
QUEZON CITY PHILIPPINES

STATISTICS 280: PRACTICAL ML FOR BUSINESS **COURSE SYLLABUS**

Instructor: Jose Ramon Batiller
Email: jabatiller1@up.edu.ph
Consultation: TWTh 6-8pm (remote)

COURSE DESCRIPTION:
This course covers the end- to-end discussion of three machine learning use cases used in business namely: recommender systems, fraud detection and conversational chatbot. This will include discussion on concepts, processes, and hands-on analysis and modeling to address the business requirements for each use case. This course will make use of python programming.

COURSE GOALS

At the end of this course, students will be able to

- Understand the various machine learning techniques that can be used for recommendation engines, fraud detection and conversational chatbots;
- Be familiar with the use of python programming and jupyter notebook for data science.
- Apply the appropriate machine learning algorithm/s to address new data science use case requirements

COURSE PREREQUISITE: 2nd Year Standing/ COI. Programming experience is required. Programming in python is good to have but not required.

COURSE REQUIREMENTS AND GRADING SYSTEM (as of August 2024)

Participation in class and forum discussions, graded assessments	70%
Group Project	30%

GRADING SCALE

[92.00, ∞)	1.0	**[62.00, 70.00)**	2.25
[87.00, 92.00)	1.25	**[55.00,62.00)**	2.50
[82.00, 87.00)	1.50	**[50.00, 55.00)**	2.75
[77.00, 82.00)	1.75	**[40.00, 50.00)**	3.00
[70.00, 77.00)	2.0	**[0, 40.00)**	INC*

*must retake the course

CLASS RULES AND POLICIES

We will use UVLe as our formal mode for online communication related to this class/course. All course resources will be uploaded in UVLe. All learning materials are for your own study purposes only and cannot be reproduced without permission.

Submissions of all graded assessments and group project will be done through our UVLe course page.
(Others to be discussed)

COMMUNICATION PLAN

- Synchronous Session

We have our Saturday class hours for the synchronous sessions. These sessions will be conducted through Zoom (or any other viable platform for all concerned). These sessions will be recorded, and the recordings will be made available to you for later or repeated viewing.

- Slack

We will use Slack as the main communications channel as well as a deployment channel for our chatbot use case. For private messaging, send direct messages in Slack.

COURSE SCHEDULE AND OUTLINE (Sequences and coverage may slightly change as we go along the course)

Week	Date	Topics	References
1	Jan 20, 2025	0. Introduction • Course outline and project overview • Anaconda installation, GitHub, Slack overview	
2	Jan 27, 2025	I. Overview • Introduction to AI/ML • Data Science Lifecycle • Use Case Introduction	Stern (2017): Chapter 2 https://www.mckinsey.com/business-functions/mckinsey-analytics/our-insights/an-executives-guide-to-ai
3	Feb 3, 2025	II. Jupyter Notebook and Python Basics • Jupyter Notebook introduction • Python 101	
4	Feb 10, 2025	III. Use Case 1: Fraud Detection (Supervised) • Understanding Fraud Types • Fraud Detection Techniques • Modeling & Evaluation • Scoring & Deployment Monitoring	Baesens (2015): Chapter 1-5
5	Feb 17, 2025	IV. Use Case 1: Fraud Detection (Unsupervised) • Data Exploration & Pre-processing • Anomaly Detection • Clustering • Social Network Analysis (SNA)	Baesens (2015): Chapter 6 Grus (2015): Chapter 18, 19, 21
6	Feb 24, 2025	V. Use Case 2: Fraud Detection (Hands-on) • Data Exploration & Pre-processing • Random Forest • Predictive modeling & Evaluation	
7	Mar 3, 2025	VI. Use Case 2: Fraud Detection (Hands-on) • Data Exploration & Pre-processing	

		• Anomaly Detection ● Predictive modeling & Evaluation	
8	Mar 10, 2025	VII. Use Case 1: Recommender Systems ● Introduction ● Types of Recommender Systems ● Evaluating Recommender Systems ● Deployment ● Case Studies	Falk (2019): Chapter 1, 3-14
9	Mar 17, 2025	VIII. Use Case 1: Recommender Systems (Hands-on) ● Data pre-processing ● Modeling & Evaluation Generating Predictions	Grus (2015): Chapter 22
10	Mar 24, 2025	IX. Use Case 3: Conversational Chatbot • Bot Introduction • Major Use Cases • Bot Building Overview ● NLP & NLU Overview ● Use Case Discussion	Shevat (2017): Chapters 1-5, 18 Raj (2018): Chapter 1-3
11	Apr 7, 2025	X. Use Case 3: Conversational Chatbot (Hands-on) • Rasa Installation ● Concepts Review ● Rasa Introduction ● Hands-on	Raj (2018): Chapter 4
12	Apr 21, 2025	XI. Use Case 3: Conversational Chatbot (Hands-on cont) • Production Considerations ● Connecting to Slack ● Chatbot Analytics ● Other Topics	Shevat (2017): Chapter 13, 19 Raj (2018): Chapter 5
13	Apr 28, 2025	Hackathon Day 1	
14	May 5, 2025	Hackathon Day 2	
15	May 12, 2025	Demo Day	
16	May 19, 2025	Demo Day (If we get delayed)	

TENTATIVE: Schedule of Classes

January	: 20, 27
February	: 3, 10, 17, 24
March	: 3, 10, 17, 24, 31
April	: 7, 14, 21, 28
May	: 5, 12, 19

Academic Calendar AY 2024-2025:
https://our.upd.edu.ph/files/calendar/regular/ACAD%20CAL%202024-2025.pdf

MAIN REFERENCES

- Grus, Joel. Data Science from Scratch: First Principles with Python. O'Reilly Media,2015
- Kane, Frank. Building Recommender Systems with Machine Learning and AI. Sundog Education, 2018
- Shevat, Amir. Designing Bots. Oreilly Media Inc, 2017
- Baesens, Bart, Veronique Van Vlasselaer and Wouter Verbeke. Fraud Analytics Using Descriptive, Predictive, and Social Network Techniques. Wiley & Sons, 2015
- Raj, Sumit. Building Chatbots with Python: Using Natural Language Processing and Machine Learning, Apress, 2018

Additional References:

- Falk, Kim. Practical Recommender Systems. Manning Publications Co, 2019
- Freed, Andrew. Conversational AI. Manning Publications Co, 2021.
- Sterne, Jim. Artifical Intelligence for Marketing.J ohn Wiley and Sons, Inc, 2017
- https://www.mckinsey.com/business-functions/mckinsey-analytics/our-insights/an-executives-guide-to-ai

ACADEMIC INTEGRITY

As a student of the University of the Philippines, I pledge to act ethically and uphold the value of honor and excellence.

I understand that suspected misconduct on given assignments/examinations will be reported to the appropriate office and if established, will result in disciplinary action in accordance with University rules, policies and procedures. I may work with others only to the extent allowed by the Instructor.

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